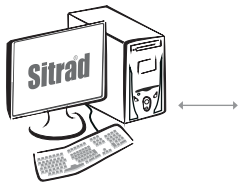
MT-530 *Super*

CONTROLLER AND DIGITAL INDICATOR TEMPERATURE AND HUMIDITY WITH SERIAL COMMUNICATION TO SITRAD

Ver.03



E251415

MT530SP03-06T-12427

1. DESCRIPTION

The **MT-530** *Super* features three outputs: one for temperature control, one for humidity control and a third auxiliary output that can be configured to command a second stage temperature or humidity control. This controller is indicated for low and average relative humidity (10-85% non-condensing), and it also features an audible signal (buzzer) that can be activated as an alarm or a timer (cyclic timer).

Its sensors of temperature and humidity are joined in an only bulb, that reduces the space in wiring of the installation.

The instrument has serial communication for connection with the SITRAD® via Internet.

Product complies with UL Inc. (United States and Canada).

2. APPLICATION

- Humidificators/dehumidificators
- Grains drying
- Laboratories
- Surgical rooms
- Climatized cellars
- Information technology centers

*For high percentage of humidity in the presence of water condensation, use the model Ri AHC-80 plus.

3. TECHNICAL SPECIFICATIONS

- **Power Supply:** MT-530 Super - 115 or 230 Vac ±10%(50/60 Hz)
  MT-530L Super - 12 or 24 Vac/dc
- **Control Temperature:** -10 to 70.0 ºC ±1.5°C (with resolution of 0.1°C)
  14 to 158 ºF ±3°F (with resolution of 1°F)
- **Control Humidity:** 10 to 85%RH ±5%RH (with resolution of 0.1%RH)
- **Load current:** 5(3)A/250Vac 1/8HP (each output)
- **Operation temperature:** 0 to 50°C
  32 to 122°F
- **Operation humidity:** 10 to 85% RH (without condensation)
- **Dimensions:** 71 x 28 x 71 mm

4. CONFIGURATIONS

4.1 - Temperature and humidity adjust (SETPOINTS):

- Press SET for 2 seconds until SEt appears, then release it. The indication t1 and the adjusted temperature for THERM output will appear.
- Use the keys ▼ and ▲ to change the value and then press SET to record it.
- Now h1 and adjusted humidity for HUMID output will appear.
- Use the keys ▼ and ▲ to change the value and then press SET again.
- Then, if the AUX output is set to control (F14 = 0, 1, 2 or 3) it may appear t2 or h2.
- Use the keys ▼ and ▲ to change the value for the AUX output and then press SET to record it.

4.2 - Parameters configuration

- Access the function F01 pressing simultaneously the keys ▼ and ▲ for 2 seconds until appearing Fun, releasing after that. Soon it will appear F01, and then press SET (short touch).
- Use the keys ▼ and ▲ to enter acess code (123) and, when ready press SET to confirm.
- Use the keys ▼ and ▲ to access the desired function.
- After selecting the function, press SET (short touch) to visualize the value configured for that function.
- Use the keys ▼ and ▲ to change the value, and when ready, press SET to memorize the configured value and return to the menu of functions.
- To leave the menu of functions and return to normal operation, press SET until appear ---.

4.4 - Parameters description

Fun	Description	CELSIUS				FAHRENHEIT			
		Min.	Max.	Unit	Standard	Min.	Max.	Unit	Standard
F01	Access code: 123 (one hundred and twenty-three)	-99	999	-	-	-99	999	-	-
F02	Thermostat operation mode (THERM output)	0 - refrig.	1 - heat	-	0 - refrig.	0 - refrig.	1 - heat	-	0 - refrig.
F03	Minimum setpoint allowed to the user (thermostat)	-10.0	70.0	°C	-10.0	14	158	°F	14
F04	Maximum setpoint allowed to the user (thermostat)	-10.0	70.0	°C	70.0	14	158	°F	158
F05	Control differential (hysteresis) of the thermostat	0.1	20.0	°C	1.5	1	36	°F	3
F06	Minimum delay to turn the thermostat output on	0	999	seg.	0	0	999	seg.	0
F07	Humidistat operation mode (HUMID output)	0 - dehum.	1 - hum.	-	1 - hum.	0 - dehum.	1 - umid.	-	1 - hum.
F08	Minimum setpoint allowed to the user (humidistat)	0	100	%RH	0	0	100	%RH	0
F09	Maximum setpoint allowed to the user (humidistat)	0	100	%RH	100	0	100	%RH	100
F10	Control differential (hysteresis) of the humidistat	0.1	20.0	%RH	5	0.1	20.0	%RH	5
F11	Minimum delay to turn the humidistat output on	0	999	sec.	0	0	999	sec.	0
F12	Humidity output (time on)	0	999	sec.	5	0	999	sec.	5
F13	Humidity output (time off)	0	999	sec.	5	0	999	sec.	5
F14	Auxiliary output operation mode (AUX)	0	10	-	5	0	10	-	5
F15	Minimum setpoint allowed to the user (AUX output)	0	100	-	0	0	100	-	0
F16	Maximum setpoint allowed to the user (AUX output)	0	100	-	100	0	100	-	100
F17	Control differential (hysteresis) of the AUX output	0.1	20.0	-	5	0.1	20.0	-	5
F18	Minimum delay to turn the AUX output on	0	999	sec.	0	0	999	sec.	0
F19	Time base of AUX output timer	0	999	-	0	0	999	-	0
F20	AUX output (time on)	0	999	sec.	5	0	999	sec.	5
F21	AUX output (time off)	0	999	sec.	5	0	999	sec.	5
F22	Low room temperature alarm	-10.0	70.0	°C	-10.0	14	158	°F	14
F23	High room temperature alarm	-10.0	70.0	°C	70.0	14	158	°F	158
F24	Low room humidity alarm	0	100	%RH	0	0	100	%RH	0
F25	High room humidity alarm	0	100	%RH	100	0	100	%RH	100
F26	Minimum delay to turn the AUX output on (alarm mode)	0	999	min.	0	0	999	min.	0
F27	Buzzer operation mode	0	1	-	1	0	1	-	1
F28	Acting point of Buzzer by low temperature	-10.0	70.0	°C	-10.0	14	158	°F	14
F29	Acting point of Buzzer by high temperature	-10.0	70.0	°C	70.0	14	158	°F	158
F30	Acting point of Buzzer by low humidity	0	100	%RH	0	0	100	%RH	0
F31	Acting point of Buzzer by high humidity	0	100	%RH	100	0	100	%RH	100
F32	Maximum time of the activated THERM output to activate the alarm	0	999	min.	0	0	999	min.	0
F33	Maximum time of the activated HUMID output to activate the alarm	0	999	min.	0	0	999	min.	0
F34	Maximum time of the activated AUX output to activate the alarm	0	999	min.	0	0	999	min.	0
F35	Buzzer time on	0	999	sec.	1	0	999	sec.	1
F36	Buzzer time off	0	999	sec.	1	0	999	sec.	1
F37	Inhibition time of Buzzer during electrical supply	0	999	min.	0	0	999	min.	0
F38	Output status in case of alarm	0	1	-	0	0	1	-	0
F39	Display mode	0	2	-	0	0	2	-	0
F40	Temperature display offset	-5.0	5.0	°C	0	-9	9	°F	0
F41	Humidity display offset	-20.0	20.0	%RH	0	-20.0	20.0	%RH	0
F42	Network equipment address RS-485	1	247	-	1	1	247	-	1

Example: Humidification
Control = 80% RH *Time on = 20 sec
Hysteresis = 5% RH *Time off = 10 sec
When humidity falls to 75% RH (80 - 5), the humidistat output starts to cycle: 20 sec. on - 10 sec. Off

4.4 - Parameters description

F01 - Access code: 123 (one hundred and twenty-three)
It is necessary to change the configuration parameters. To visualize the adjusted parameters, it is not necessary to insert this access code.

F02 - Thermostat operation mode (THERM output)
- 0 Refrigeration
- 1 Heating

F03 - Minimum setpoint allowed to the end user (thermostat)

F04 - Maximum setpoint allowed to the end user (thermostat)
It is to prevent that incorrect high or low temperatures be regulated.

F05 - Control differential (hysteresis) of the thermostat
It is the difference of temperature (hysteresis) between ON and OFF the THERM output.

F06 - Minimum delay to turn the thermostat output on
It is the minimum time that the thermostat will keep turned off, it means, the space of time between the last stop ant the next start.

F07- Humidistat operation mode (HUMID output)
- 0 Dehumidification
- 1 Humidification

F08 - Minimum setpoint allowed to the user (humidistat)

F09 - Maximum setpoint allowed to the user (humidistat)
Electronic limits whose purpose is prevent that too high or too low setpoint humiditys are regulated.

F10 - Control differential (hysteresis) of the humidistat
It is the difference of humidity (hysteresis) between turn ON and turn OFF the HUMID output.

F11 - Minimum delay to turn the humidistat output on
It is the minimum time that the HUMID output will keep turned off, it means, the space of time between the last stop ant the next start.

F12 - Humidity output (time on)
It allows to adust the time that HUMID output will keep turned on.

F13 - Humidity output (time off)
It allows to adust the time that HUMID output will keep turned off.
Note: F12 and F13 functions control a cyclical program (in seconds) for the humidistat output.
This cyclical program allows that pulverized water has time to transform in relative air humidity.
To disable this function, adjust then with value "00.0".

F14 - Auxiliary output operation mode (AUX)
- 000 Refrigeration
- 001 Heating
- 002 Dehumidification
- 003 Humidification
- 004 Intra-range alarm
- 005 Extra-range alarm
- 006 Independent cyclic timer
- 007 Cyclic timer operating only when the temperature reaches the setpoint (THERM output deactivated)
- 008 Cyclic timer operating only when the humidity reaches the setpoint (HUMID output deactivated)
- 009 Cyclic timer operating when the temperature or humidity reaches their setpoint
- 010 Cyclic timer operating only when the temperature and humidity reaches their setpoints.

When changing the value of this function the following parameters will be automatically adjusted with their default values: F15, F16, F17 and setpoint for the AUX output.

F15 - Minimum setpoint allowed to the user (AUX output)

F16 - Maximum setpoint allowed to the user (AUX output)
Electronic limits whose purpose is prevent that too high or too low setpoint values are regulated.
The limits will depend on the operation mode of the output adjusted in F14.

F17 - Control differential (hysteresis) of the AUX output
It is the difference of temperature or humidity (hysteresis) between turn ON and turn OFF the AUX output. This function depends on the operation mode of the output adjusted in F14.

F18 - Minimum delay to turn the AUX output on
It is the minimum time that the AUX output will keep turned off, it means, the space of time between the last stop ant the next start.
This time is valid only when AUX output will be configured in the control mode (F14 configured in 0, 1, 2 or 3).

F19 - Time base of AUX output timer
Allows configuring the on or off time scale for AUX output cyclic timer.

Value	Time on (F20)	Time off (F21)
0	Seconds	Seconds
1	Minutes	Minutes
2	Seconds	Minutes
3	Minutes	Seconds

F20 - AUX output (time on)
It allows to adust the time that AUX output will keep turned on when set to alarm or cyclical timer. See F14.

F21 - AUX output (time off)
It allows to adust the time that AUX output will keep turned off when set to alarm or cyclical timer. See F14.

F22 - Low room temperature alarm
Temperature for activation of the low temperature alarm.

F23 - High room temperature alarm
Temperature for activation of the high temperature alarm.

F24 - Low room humidity alarm
Humidity for activation of the low humidity alarm.

F25 - High room humidity alarm
Humidity for activation of the high humidity alarm.

F26 - Minimum delay to turn the AUX output on (alarm mode)
It is the minimum time that the AUX output will keep turned off after controller initialization. This time is valid only when AUX output will be configured in the alarm mode (F14 configured in 4 or 5).

F27 - Buzzer operation mode
- 0 Intra-range alarm
- 1 Extra-range alarm

F28 - Acting point of Buzzer by low temperature
It is the inferior value of temperature to the buzzer alarm act as the configured Operation Mode of Buzzer (F27).

F29 - Acting point of Buzzer by high temperature
It is the superior value of temperature to the buzzer alarm act as the configured Operation Mode of Buzzer (F27)

F30 - Acting point of Buzzer by low humidity
It is the inferior value of humidity to the buzzer alarm act as the configured Operation Mode of Buzzer (F27).

F31 - Acting point of Buzzer by high humidity
It is the superior value of humidity to the buzzer alarm act as the configured Operation Mode of Buzzer (F27).

F32 - Maximum time of the activated THERM output to activate the alarm
Allows configuring the maximum time the output THERM can stay activated without reaching the setpoint before activating the audible alarm (BUZZER). To deactivate this function, just decrement the value until the message OFF is displayed.

F33 - Maximum time of the activated HUMID output to activate the alarm
Allows configuring the maximum time the output HUMID can stay activated without reaching the setpoint before activating the audible alarm (BUZZER). To deactivate this function, just decrement the value until the message OFF is displayed.

F34 - Maximum time of the activated AUX output to activate the alarm
Allows configuring the maximum time the output AUX can stay activated without reaching the setpoint before activating the audible alarm (BUZZER). To deactivate this function, just decrement the value until the message OFF is displayed.

F35 -Buzzer time on
It is the time that the Buzzer will be turned on (cycle on). To turn it off the sonore alarm (Buzzer) adjust the value "0" to this function.

F36 - Buzzer time off
It is the time that the buzzer will be turned off (cycle off). To turn the sonore alarm (Buzzer) always on, adjust the value "0" to this function.

F37 - Inhibition time of Buzzer during electrical supply
It is the time were the alarm will kept turned off even if in alarm contitions.
It serves to inhibit the buzzer during the time while the system do not reaches the working control temperature.

F38 - Output status in case of alarm
- 0 Status output do not change in case of alarm.
- 1 Turn off the output THERM, HUMID and AUX.

Note: The AUX output will not turn off if it is set to alarm output intra-or-extra range. In case of sensor failure the outputs will be switched off independently of the parameter settled in that function.

F39 - Display mode
- 0 Alternated indication of temperature and humidity
- 1 Only indication of temperature
- 2 Only indication of humidity

F40 - Temperature display offset
It allows to compensate eventual shunting lines in the reading of temperature proceeding from the exchange of the sensor or cable lenght alteration.

F41 - Humidity display offset
It allows to compensate eventual shunting lines in the reading of humidity proceeding from the exchange of the sensor or cable lenght alteration.

F42 - Network equipment address
This is the device address for communication with **Sitrad**® software.
Note: You cannot have two or more devices with the same address in the network.

5. FUNCTIONS WITH FACILITATED ACCESS

5.1- Registers of minimum and maximum temperature and humidity

Press ▲. Will appear t followed for minimum and maximum registered temperatures. After that will appear h and the minimum and maximum registered humidity.
Note: To reset the registers, keep pressed ▲ during the visualization of the minimum and maximum registers until appear rSt .

5.2 - To visualize humidity or temperature

If the F39 function is not in the alternating way of visualization ("0") it´s possible visualize temperature or humidity by pressing the ▼ key.

5.3 - Buzzer Inhibit

If it is activated, simultaneously press ▼ and SET to inhibit the buzzer.

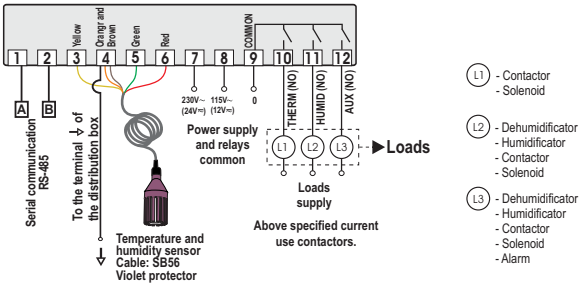
6. SIGNALLING

Led THERM on - Thermostat output on
Led HUMID on - Humidistat output on
Led AUX on - Auxiliar output on
Led BUZZ on - Buzzer activated
Er1 - Irregular temperature sensor
Er2 - Irregular humidity sensor
PPP - Invalid configuration parameters;
- In this situation the outputs are turned off;
- Check which parameters have invalid data and correct them to return to normal operation.

7. SELECTION OF THE UNIT (C° / F°)

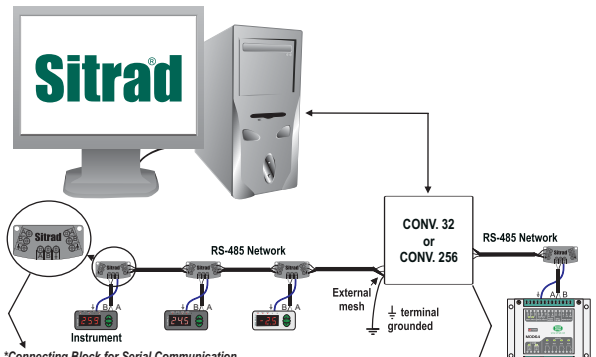
In order to define the unit that the instrument will operate in, enter function "F01" with the access code "231" and confirm with the SET key. Press the ▲ key and the indication Uni will appear. Press SET to choose between °C or °F and confirm. After selecting the unit the FAC message will appear, and the instrument will return to the function "F01". Every time that the unit is changed, the parameters should be reconfigured, since they assume the "standard" values.

8. WIRING DIAGRAM



	MT-530 Super	MT-530L Super
9 - 8	115V~	12V ≃
9 - 7	230V~	24V ≃

Integrating Controllers, RS-485 Serial Interface and Computer

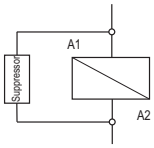


Connecting Block for Serial Communication
Used to connect more than one instrument to the Interface. The wire's connections must be made in agreement with the following rules: terminal **A** of the instrument connects to the terminal **A** of the connecting block, that must be connected with the terminal **A** of the Interface. Repeat the action for terminals **B** and ⏚ , being ⏚ the cable shield.
the terminal ⏚ of distribution box must be connected to the respective terminals ⏚ of each instrument.
Sold Separately

RS-485 Serial Interface
Device used to establish the connection Full Gauge Controls' instruments with the Sitrad®.

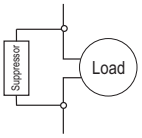
IMPORTANT
According to the chapters from the IEC60364 standard:
1: Install protectors against over voltage on power supply
2: Sensor cables and computer signals can be together, however not at the same place where power supply and load wires pass for
3: Install suppresor of transient in parallel to loads to increase the usefull life of the relays

Contact suppressor connection diagram



A1 e A2 are the contactor coils.

Diagram for suppressor installation for direct drive load inputs



For direct activation the maximum specified current should be taken into consideration.

Suppressors on offer from Full Gauge Controls

Note: The sensor cable lenght can be increased by the user until 200 meters using PP 2 x 24 AWG cable.

ENVIRONMENTAL INFORMATION
Package:
The packages material are 100% recyclable. Just dispose it through specialized recyclers.

Products:
The electro components of Full Gauge controllers can be recycled or reused if it is disassembled for specialized companies.

Disposal:
Do not burn or throw in domestic garbage the controllers which have reached the end-of-life. Observe the respectively law in your region concerning the environmental responsible manner of dispose its devices. In case of any doubts, contact Full Gauge controls for assistance.

PROTECTIVE VINYL:
This adhesive vinyl (included inside the packing) protects the instruments against water drippings, as in commercial refrigerators, for example. Do the application after finishing the electrical connections.

Remove the protective paper and apply the vinyl on the entire superior part of the device, folding the flaps as indicated by the arrows.